

CURRICULUM VITAE

Name: Myung Hee Park

Date and Place of Birth: December 16, 1949; Taegu, Korea

Citizenship: United States

Education:

1972	B.S.	Seoul National University, Seoul, Korea: chemistry,
1976	Ph.D.	Brown University, Providence, RI: chemistry,

Brief Chronology of Employment:

1998-present	Chief, Molecular and Cellular Biochemistry Unit, OPCB, NIDCR, NIH
1996-present	Research Chemist, GS-14 Oral and Pharyngeal Cancer Branch, NIDCR, NIH
1989-1996	Research Chemist, GS-13 Laboratory of Cellular Development and Oncology, NIDR, NIH
1984-1989	Senior Staff Fellow, Laboratory of Oral Biology and Physiology, NIDR,
1982-1984	Staff Fellow, Laboratory of Biochemistry, NIDR, NIH
1979-1982	Visiting Fellow, Laboratory of Biochemistry, NIDR, NIH
1976-1978	Research Associate, Department of Biology, Massachusetts Institute of Technology

Honors and Awards:

1994	NIH Merit Award
2000	CKD/ Society of Biomedical Research Award

Membership and Activity in Professional Societies:

	The American Society for Cell Biology
	The American Society for Biochemistry and Molecular Biology
	Korean Scientists and Engineers Association
	Society for Biomedical Research
2005	Annual Meeting Organizing Committee, The Society of Biomedical Research
2004	Chairperson, Meeting Organizing Committee, The Society of Biomedical Research
2003-Jul 2004	Technology Adviser, Rexahn Corporation, Rockville, MD
1995-2002	Treasurer, The Society of Biomedical Research

1995-2000 Biomedical Research	Annual Meeting Organizing Committee, The Society of
2000	President, NIH Korean Scientist Association
1999	Vice President, NIH Korean Scientist Association
1997	Treasurer, NIH Korean Scientist Association

Patents:

1. US Patent No 5,344,846, September 6, 1994 Jakus J, Park MH, Wolff EC. and Folk JE (1994) Compositions and methods for inhibiting deoxyhypusine synthase and the growth of cells.
2. International Patent Application under the Patent Cooperation Treaty (PCT) International Application Number PCT/US02/26909 Filing Date August 23.2002; International Publication Date 06.03.2003 Priority Date August 23 2001 US Provisional Patent Application No. 60/314,561 August 23, 2001; Park MH, Clement PMJ, Hanauske-Abel HM, Wolff EC, Kleinman HK and Cracchiolo BM (2003) Method of inhibiting formation of vascular channels and methods of inhibiting proliferation
3. US Provisional Patent Application No November 2003 Hanauske-Abel HM, Popowicz A, Wolff EC, Clement PMJ, Park MH, Cracchiolo BM. Methods of Diagnosing and Treating Hyperproliferative Disorders
4. US Provisional Patent Application No December 2003 Hanauske-Abel HM, Palumbo P, Cracchiolo BM, Park MH, Wolff EC, Hanauske A-R and McLendon G. Method of preventing survival of retrovirally infected cells and of inhibiting formation of infectious retroviruses

Editorial Responsibilities:

1999- Present	Editorial Board Member: Archives of Pharmacal Research
1997-1998	Editorial Board Member: Journal of Biomedical Research

Invited Lectures and Symposium Presentations:

2005	Gordon Research Conference on Polyamines, New London, Connecticut
2004	International Conference on Polyamines, Kazusa Arc, Japan
2002	Annual Meeting of Biochemistry, Kyoto, Japan
	Korean National Institute of Health, Seoul, Korea
	Skin Research Institute, Pacific R & D Center, Yongin, Korea
	Seoul National University, School of Medicine, Seoul, Korea
	Catholic University of Korea, Cancer Research Center, Seoul, Korea
	Catholic University of Daegu, Daegu, Korea
1999	Gordon Research Conference on Polyamines, Oxford, United Kingdom
1998	Cancer Research Institute, Catholic University, Seoul, Korea
	Key Myung University Medical School, Taegu, Korea

- 1996 Kangnung National University College of Dentistry, Kangnung, Korea
Workshop on eIF-5A Function, Genetic Therapy, Inc. Gaithersburg, MD
Tokyo International Symposium on Polyamines, Tokyo, Japan
Tokyo Medical and Dental University, Tokyo, Japan
Seoul National University, Seoul, Korea
Duk-Sung Women's College, Seoul Korea
LBG, NIDDK, NIH, Bethesda MD
LMCB, NIDDK, NIH, Bethesda, MD
- 1995 Korean Green Cross Corporation, Yongin, Korea
Korean National Institute of Health, Seoul, Korea
Schering-Plough Institute, Kenilworth, NJ
Sandoz Research Institute, Vienna, Austria
International Congress on Amino Acids, Vienna, Austria
Gordon Conference on Polyamines, Meriden NH
- 1994 Meeting of the Society of Biomedical Research
Eisai Research Institute, Andover, MA
- 1993 Merck Sharp & Dohme Research Laboratory, WestPoint, PA
University of Maryland, School of Pharmacy, Baltimore, MD
- 1990 Seoul National University, Seoul, Korea
International Symposium on Polyamines in Molecular and Medical
Biology, Kyoto, Japan
- 1989 Gordon Conference on Polyamines, Newport. RI
Howard University, Washington, DC
- 1988 University of Rome, Rome, Italy
International Symposium on Polyamines in Biochemical and Clinical
Research, University of Naples, Naples, Italy
- 1986 Georgetown University, Medical School, Washington, DC
- 1984 FASEB Meeting, Mini-symposium on Polyamines, St. Louis, MO
- 1983 Pennsylvania State University, College of Medicine, Hershey, PA
Gordon Conference on Polyamines, New London, NH

Ad-hoc/ Grant Reviewer:

1985	Ad Hoc Review Member, Site Visit, University of Arizona
1987	Ad Hoc Review Member, Site Visit, Harvard Medical School
1994	Grant Review Board Member, Korean Science Foundation
2001	Consultant, NIH CSR Study Section
2003	Grant Review Board Member, FY2003 USAMRMC/CDMRP Breast Cancer Research Program

Intramural Research Service Activities

2004	Search Committee for a senior scientist, NIDCR, NIH
2001	Search Committee, Laboratory of Retinal Cell and Molecular Biology, National Eye Institute
1997-1999	NIDCR Animal Care and Use Committee
1998	BSC Report Format Committee
1997-1998	NIDR Equipment Committee
1997	NIDR DIR Seminar Committee
1997	NIDR Discretionary Funds Committee
1993-1994	NIDR Visiting Scholars Committee
1992-1996	NIDR Safety Committee

Research Areas: Protein synthesis, Post-translational protein modification, enzymology, polyamine biosynthesis and metabolism, cell growth regulation, cancer cell biology, gene expression, enzyme inhibitors design and application

Publications

1. Lusk JE and **Park MH**. (1975) Phospholipase activity plays no role on the action of colicin K. *Biochim. Biophys. Acta* 394: 129-134.
2. **Park MH**, Wong BB and Lusk JE. (1976) Mutants in three genes affecting transport of magnesium in *Escherichia coli*: Genetics and physiology. *J. Bacteriology* 126: 1096-1103.
3. **Park MH**, Berg WH and Buchanan JM (1979) The formation of plasminogen activator during viral transformation of chick embryo fibroblasts. *Chem. Phys. of Human Plasma Proteins* 315-328.
4. Folk JE, **Park MH**, Chung SI, Schrode J, Lester EP and Cooper HL (1980) Polyamines as physiological substrates for transglutaminases. *J. Biol. Chem.* 255: 3695-3700.
5. **Park MH**, Cooper HL and Folk JE (1981) Identification of hypusine, an unusual amino acid, in a protein from human lymphocytes and of spermidine as its biosynthetic precursor. *Proc. Natl. Acad. Sci. USA* 78:2869-2873.
6. **Park MH**, Cooper HL and Folk JE (1982) The biosynthesis of protein-bound hypusine [N -(4-amino-2-hydroxybutyl)lysine]: lysine as the amino acid precursor and the intermediate role of deoxyhypusine [N -(4-aminobutyl)lysine]. *J. Biol. Chem.* 257: 7217-7222.
7. Cooper HL, **Park MH** and Folk JE (1982) Posttranslational formation of hypusine in a single major protein occurs generally in growing cells and is associated with activation of lymphocyte growth. *Cell* 29:791-797.
8. **Park MH**, Cooper HL and Folk JE (1983) Chromatographic identification of hypusine [N -(4-amino-2-hydroxybutyl)lysine] and deoxyhypusine [N -(4-aminobutyl)lysine]. *Methods in Enzymology* 94: 458-462.
9. Cooper HL, **Park MH**, Folk JE, Safer B and Braverman R (1983) Identification of the hypusine-containing protein Hy⁺ as translation initiation factor eIF-4D. *Proc. Natl. Acad. Sci. USA* 80: 1854-1857.
10. Cooper HL, **Park MH** and Folk JE (1984) Hypusine formation: A unique posttranslational modification of translation initiation factor eIF-4D. *Methods in Enzymology* 106: 344-351.
11. **Park MH**, Chung SI, Cooper HL and Folk JE (1984) The mammalian hypusine-containing protein, eIF-4D. structural homology of this protein from several species. *J. Biol. Chem.* 259: 4563-4565.
12. **Park MH**, Liberato DJ, Yergey AL and Folk JE (1984) The biosynthesis of hypusine [N -(4-amino-2-hydroxybutyl)lysine]: alignment of the butylamine segment and source of the secondary amino nitrogen. *J. Biol. Chem.* 259: 12123- 12127.
13. Abbruzzese A, **Park MH** and Folk JE (1986) Deoxyhypusine hydroxylase from rat testis: partial purification and characterization. *J. Biol. Chem.* 261: 3085-3089.
14. Abbruzzese A, **Park MH** and Folk JE (1986) Indirect assays for deoxyhypusine hydroxylase using dual-label ratio changes and oxidative release of radioactivity. *Anal. Biochem.* 154: 664-670.
15. **Park MH** and Folk JE (1986) Biosynthetic labeling of hypusine in mammalian cells: carbon-hydrogen bond fissions revealed by dual-labeling. *J. Biol. Chem.* 261: 14108-14111.

16. **Park MH**, Liu TY, Neece SH and Swiggard WJ (1986) Eukaryotic initiation factor 4D: purification from human red blood cells and the sequence of amino acids around its single hypusine residue. *J. Biol. Chem.* 261: 14515-14519.
17. Abbruzzese A, **Park MH** and Folk JE (1987) Hypusine biosynthesis: studies on deoxyhypusine hydroxylase. *Italian J. Biochem.* 36: 45A-48A.
18. **Park MH** (1987) Regulation of biosynthesis of hypusine in Chinese hamster ovary cells: evidence for eIF-4D precursor polypeptides. *J. Biol. Chem.* 262: 12730-12734.
19. **Park MH**, Abbruzzese A and Folk JE (1988) Post-translational formation of hypusine: biogenesis of translation initiation factor eIF-4D. In: Zappia, V., Galletti, P., Porta, R. and Wold, F. eds: *Advances in Post-translational Modifications of Protein and Aging*. Plenum Press, pp 633-640,.
20. Abbruzzese A, Liguori V, Isernia T and **Park MH** (1988) Inhibition of deoxyhypusine hydroxylase by polyamines. *Italian J. Biochem.* 37: 187A-189A.
21. **Park MH** (1988) Identification of an eukaryotic initiation factor 4D precursor in spermidine-depleted Chinese hamster ovary cells. *J. Biol. Chem.* 263: 7447-7449.
22. **Park MH** and Wolff EC (1988) Cell-free synthesis of deoxyhypusine: separation of protein substrate and enzyme, and identification of 1,3-diaminopropane as a product of spermidine cleavage. *J. Biol. Chem.* 263: 15264-15269.
23. **Park MH**, Wolff EC, Abbruzzese A and Folk JE (1988) Biosynthesis of hypusine in eIF-4D precursors. In: Zappia V and Pegg AE eds. *Progress in Polyamine Research*. New York, NY: Plenum Press, pp. 435-447.
24. Abbruzzese A, Liguori V and **Park MH** (1988) Deoxyhypusine hydroxylase. In: Zappia, V and Pegg AE, eds. *Progress in Polyamine Research*. New York, NY: Plenum Press, pp. 459-466.
25. Abbruzzese A, **Park MH**, Beninati S and Folk JE (1989) Inhibition of deoxyhypusine hydroxylase by polyamines and by a deoxyhypusine peptide. *Biochim. Biophys. Acta* 997: 248-255.
26. **Park MH** (1989) The essential role of hypusine in eukaryotic translation initiation factor 4D (eIF-4D): purification of eIF-4D and its precursors and comparison of their activities. *J. Biol. Chem.* 264: 18531-18535.
27. Wolff EC, **Park MH** and Folk JE (1990) Cleavage of spermidine as the first step in deoxyhypusine synthesis. *J. Biol. Chem.* 265: 4793-3799.
28. Abbruzzese A, Hanauske-Abel HM, **Park MH**, Henke S and Folk JE (1991) The active site of deoxyhypusyl hydroxylase: use of catecholpeptides and their component chelator and peptide moieties as molecular probes. *Biochim. Biophys. Acta* 1077:159-166.
29. Chung SI, **Park MH** Folk JE and Lewis MS (1991) Eukaryotic initiation factor 5A: the molecular form of the hypusine-containing protein from human erythrocytes. *Biochim. Biophys. Acta* 1076: 448-451.
30. **Park MH**, Wolff EC, Smit-McBride Z, Hershey JWB and Folk JE (1991) Comparison of the activities of variant forms of eIF-4D: the requirement for hypusine or deoxyhypusine. *J. Biol. Chem.* 266: 7988-7994.
31. Wolff EC, Kinzy TG, Merrick WC and **Park MH** (1992) Two isoforms of eIF-5A in chick embryo: isolation, activity and comparison of sequences of the hypusine-containing proteins. *J. Biol. Chem.* 267:6107-6113.

32. **Park MH**, Wolff EC, and Folk JE (1993) Review. Hypusine: its post-translational formation in eukaryotic initiation factor 5A and its potential role in cellular regulation. *BioFactors* 4: 95-104.
33. Jakus J, Wolff EC, **Park MH** and Folk JE (1993) Features of the spermidine-binding site of deoxyhypusine synthase as derived from inhibition studies: effective inhibition by *bis*- and *mono*-guanylated diamines and polyamines. *J. Biol. Chem.* 268: 13151-13159.
34. Rinaudo MS, Joe YA and **Park MH** (1993) Cloning and sequencing of a chick embryo cDNA encoding the 20-kDa hypusine-containing protein, eIF-5A. *Gene* 137: 303-307.
35. **Park MH**, Wolff EC and Folk JE (1993) Review. Is hypusine essential for eukaryotic cell proliferation? *Trends in Biochemical Sciences* 18: 475-479.
36. Hanauske-Abel, HM, **Park MH**, Hanauske A-R, Popowicz AM, Lalande M and Folk JE (1994) Inhibition of G1-S transition by inhibitors of deoxyhypusine hydroxylation. *Biochem. Biophys. Acta.* 1221: 115-124.
37. Joe YA and **Park MH** (1994) Structural features of the eIF-5A precursor required for post-translational synthesis of deoxyhypusine. *J. Biol. Chem.* 269: 25916-25921.
38. **Park MH**, Wolff EC, Lee YB and Folk JE (1994) Antiproliferative effects of inhibitors of deoxyhypusine synthase: inhibition of growth of Chinese hamster ovary cells by guanyl diamines. *J. Biol. Chem.* 269: 27827-27832.
39. McCaffrey TA, Pomerantz KB, Sanborn TA, Spokojny AM, Du B, **Park, MH**, Folk JE, Lamberg A, Kivirikko KI, Falcone DJ, Mehta SB and Hanauske-Abel HM (1995) Specific inhibition of eIF-5A and collagen hydroxylation by a single agent: antiproliferative and fibrosuppressive effects on smooth muscle cells from human coronary arteries. *J. Clin. Invest.* 95: 446-455.
40. Wolff EC, Lee YB, Chung SI, Folk JE and **Park MH** (1995) Deoxyhypusine synthase from rat testis: purification and characterization. *J. Biol Chem.* 270: 8660-8666.
41. Lee YB, Wolff EC, **Park MH** and Folk JE (1995) Diamine and triamine analogs and derivatives as inhibitors of deoxyhypusine synthase: synthesis and biological activity. *J. Med. Chem.* 38: 3053-3061.
42. Kang KR, Wolff EC, **Park MH**, Folk JE. and Chung SI (1995) Identification of *YHR068w* in *Saccharomyces cerevisiae* as a gene for deoxyhypusine synthase: expression and characterization of the enzyme. *J. Biol. Chem.* 270: 18408-18412.
43. Joe YA, Wolff EC and **Park MH** (1995) Cloning and expression of human deoxyhypusine synthase cDNA: structure-function studies with the recombinant enzyme and mutant proteins. *J. Biol. Chem.* 270: 22386-22393.
44. Lee YB, Joe YA and **Park MH** (1995) Inhibitors of hypusine biosynthesis: potential anticancer agents. *J. Biomed. Res.* 5: 46-52
45. **Park MH**, Joe YA, Kang KR, Lee YB and Wolff EC (1996) The polyamine-derived amino acid hypusine: its posttranslational formation in eIF-5A and its role in cell proliferation. *Amino Acids* 10: 109-121.
46. Lee YB and **Park MH** (1996) Inhibitors of deoxyhypusine synthase: structural features and biological study. *Proc. 7th KSEA Northeast Regional Conf.* (1996): pp 95-99
47. Wolff EC, Folk JE and **Park MH** (1997) Enzyme-substrate intermediate at lysine-329 of human deoxyhypusine synthase. *J. Biol. Chem.* 272: 15865-15871
48. **Park MH**, Lee YB and Joe YA (1997) Hypusine is essential for eukaryotic cell

- proliferation. *Biol. Signals* 6: 115-123
49. Joe YA, Wolff EC, Lee YB and **Park MH** (1997) Enzyme-substrate intermediate at a specific lysine residue is required for deoxyhypusine synthesis: the role of Lys³²⁹ in human deoxyhypusine synthase. *J. Biol. Chem.* 272: 32679-32685
 50. **Park MH**, Joe YA and Kang KR (1998) Deoxyhypusine synthase activity is essential for cell viability in the yeast *Saccharomyces cerevisiae*. *J. Biol. Chem.* 273: 1677-1683
 51. Liao D-I, Wolff EC, **Park MH** and Davies DR (1998) Crystal Structure of the NAD complex of human deoxyhypusine synthase: an enzyme with a ball and chain mechanism for blocking the active site. *Structure* 6: 23-32
 52. Wolff EC and **Park MH** (1999) Identification of Lysine³⁵⁰ of yeast deoxyhypusine synthase as the site of enzyme intermediate formation. *Yeast* 15: 43-50
 53. Lee YB, Joe YA, Wolff EC, Dimitriadis EK and **Park MH** (1999): Complex formation between human deoxyhypusine synthase and its protein substrate, the eIF5A precursor. *Biochem. J.* 340: 273-281
 54. Wolff EC, Wolff J and **Park MH** (2000): Deoxyhypusine synthase generates and uses bound NADH in a transient hydride transfer mechanism. *J. Biol. Chem.* 275, 9170-9177
 55. Lee CH, Marekov LN, Kim SY, Brahim JS, **Park MH** and Steinert PM (2000) Small proline-rich protein 1 is a major component of cornified cell envelope of normal human oral keratinocytes. *FEBS Lett.* 477, 268-272
 56. Lee CH and **Park MH** (2000) Human deoxyhypusine synthase: Interrelationship between the binding of NAD and substrates. *Biochem. J.* 352, 851-857
 57. Lee CH, Um P and **Park MH** (2001) Structure/function studies of human deoxyhypusine synthase: Identification of amino acids critical for the binding of spermidine and NAD. *Biochem. J.* 355, 841-849
 58. Lee Y, Kim HK, Kim YY, **Park MH** and Joe YA (2002) Effects of N¹-guanyl-1,7-diaminoheptane, an inhibitor of deoxyhypusine synthase, on endothelial cell growth, differentiation and apoptosis. *Mol. Cell. Biochem.* 237 (1-2), 69-76
 59. Clement PMJ, Hanauske-Abel HM, Wolff EC, Kleinman HK and **Park MH** (2002) The antifungal drug ciclopirox inhibits deoxyhypusine and proline hydroxylation, endothelial cell growth and angiogenesis *in vitro*. *Int. J. Cancer* 100, 491-498
 60. Kang KR, Kim J.S, Chung SI, **Park MH**, Kim Y W, Lim D and Lee S.Y (2002) Deoxyhypusine synthase is phosphorylated by protein kinase C *in vivo* as well as *in vitro*. *Exp Mol Med* 34, 489-495
 61. Leethanakul C, Knezevic V, Patel V, Amornphimoltham P, Gillespie J, Shillitoe EJ, Emko P, **Park MH**, Emmert-Buck MR, Strausberg RL, Krizman DB and Gutkind JS (2003) Gene discovery in oral squamous cell carcinoma through the Head and Neck Cancer Genome Anatomy Project: confirmation by microarray analysis. *Oral Oncology* 39, 248-258
 62. Park J-H, Wolff EC, Folk JE and **Park MH** (2003) Reversal of the deoxyhypusine synthesis reaction: Generation of spermidine or homospermidine from deoxyhypusine by deoxyhypusine synthase. *J. Biol. Chem.* 278, 32683-32691
 63. Clement PMJ, Henderson A, Jenkins ZA, Smit-McBride Z, Wolff EC, Hershey JWB., **Park MH** and Johansson HE (2003) Identification and characterization of eukaryotic initiation factor 5A-2. *Eur. J. Biochem* 270, 4254-4263
 64. Cracchiolo BM, Heller DS, Clement PMJ, Wolff EC, **Park MH** and Hanauske-Abel HM (2004) Aberrant expression of the hypusine-containing eukaryotic initiation factor 5A (eIF5A) in intraepithelial neoplasia of the vulva. *Gynecologic Oncology* 94, 217-222

65. Jeon GA, Lee J-S, Patel V, Gutkind JS, Thorgeirsson S, Kim EC, Chu I-S and **Park MH** (2004) Global gene expression profile of human head and neck squamous carcinoma cell lines. *Int. J. Cancer* 112, 249-258
66. Umland TC, Wolff EC, **Park MH** and Davies DR (2004) A new crystal structure of deoxyhypusine synthase reveals the configuration of the active site enzyme and of an enzyme:NAD:inhibitor ternary complex. *J. Biol. Chem.* 279, 28697-28705
67. Murozumi K, Nishimura K, Shirahata A, **Park MH**, Kashiwagi K and Igarashi K (2005) Independent roles of eIF5A and polyamines in cell proliferation. *Biochem. J.* 385, 779-785
68. Dong Z, Arnold RJ, Yang Y, Park MH, Hrnčirova P, Mechref Y, Novotny MV and Zhang JT (2005) *Mol. Cell. Proteomics in press*